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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,147	01/31/2001	Arnaud Gesnot	PHFR000011	5941

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EXAMINER

THOMPSON, JAMES A

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 07/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/773,147

Applicant(s)

GESNOT, ARNAUD

Examiner

James A. Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. In view of the Appeal Brief filed on 15 May 2006, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

David K. Moore



DAVID MOORE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

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Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. **Claim 3 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.** Claim 3 recites a computer program product comprising a set of instructions. As such, claim 3 is simply a computer program listing, and does not define any structural and functional interrelationship between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. A computer program listing is merely non-functional descriptive material, and does not itself produce any concrete, tangible and useful result, and is therefore nonstatutory.

4. **Claim 4 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.** Claim 4 recites a computer program product comprising a set of instructions. As such, claim 4 is simply a computer program listing, and does not define any structural and functional interrelationship between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. A computer program listing is merely non-functional descriptive material, and does not itself produce any concrete, tangible and useful result, and is therefore nonstatutory.

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Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh (US Patent 5,594,767) and Moronaga (US Patent 5,229,864).

Regarding claim 1: Hsieh discloses a method of processing an input signal (figure 4 of Hsieh), said input signal blocks (column 4, lines 42-46 and lines 53-65 of Hsieh) and said blocks comprising n-bit binary input samples (column 3, lines 32-35 of Hsieh), with n being an integer (inherent for digital data). The input signal is divided into blocks based on the edge only image data (column 4, lines 42-46 of Hsieh), and classified based on the CT number, which denotes the type of material detected in the image (column 4, lines 53-65 of Hsieh).

Said method of processing comprises at least:

- a low pass filtering step applied to the input signal (figure 4(60) and column 4, lines 34-40 of Hsieh), which results in a filtered signal comprising filtered samples (column 4, lines 36-40 of Hsieh).
- a determination step for determining a correction ("enhancement" in Hsieh) area around block boundaries (figure 4(62-64); column 4, lines 41-45; and column 5, lines 20-26 of Hsieh), said determination step including

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computing mask values ("edge only" or difference image data) associated with the input samples (figure 4(62) and column 4, lines 42-46 of Hsieh) using the filtered samples (column 4, lines 35-42 of Hsieh), said correction area corresponding to an area where the mask values are different from zero (column 4, lines 42-46 of Hsieh - difference image data which shows the edges is clearly non-zero).

- a correction step for enhancing the filtered samples belonging to the correction area (figure 4(68) and column 6, lines 4-11 of Hsieh), which results in an output signal (column 6, lines 11-16 of Hsieh - the resultant image is the output signal).

Hsieh does not disclose expressly that said correction step adds a random binary number comprising at least one bit to the filtered samples belonging to the correction area.

Moronaga discloses adding a random binary number comprising at least one bit (any digital number inherently comprises at least one bit) to input samples (figure 12(302) and column 12, lines 50-56 of Moronaga).

Hsieh and Moronaga are combinable because they are from the same field of endeavor, namely correcting and enhancing digital image data based on digital image data region characteristics. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add random numbers to the input samples, as taught by Moronaga, wherein the input samples are the filtered samples taught by Hsieh. This would necessarily occur since in Hsieh the image data is first low-pass filtered in order to generate smoothed image data (column 4, lines 34-37 of Hsieh). The motivation for doing so would have been that adding random noise helps to eliminate distortions of

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the block (region) contours in the resultant image (column 11, lines 16-20 of Moronaga). Therefore, it would have been obvious to combine Moronaga with Hsieh to obtain the invention as specified in claim 1.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh (US Patent 5,594,767), Moronaga (US Patent 5,229,864), and Suzuki (US Patent 5,907,370).

Regarding claim 2: Hsieh discloses:

- the mask values are equal to the difference between the smoothed (low-pass filtered) image data and the original input image data (column 4, lines 41-46 of Hsieh). Thus, the difference image data corresponds to the bits of lower significance since the difference between the smoothed image data and the original image data will naturally be small, and therefore in the bits of lower significance. If not, then the smoothed image data could not properly be considered "smoothed" since the difference between the smoothed image data and the original image data would be great.
- the filtering step is applied around block boundaries (column 4, lines 40-46 of Hsieh).

Hsieh and Moronaga do not disclose expressly a step of multiplying the input samples by a power of 2, which results in a modified signal comprising modified samples of m-bit binary numbers, said filtering step being applied to the modified signal, said determination step comprising a computing sub-step of mask values equal to the m-n least significant bits of the filtered samples, and said correction step adding the random binary number to the filtered samples divided by the power of 2

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when the mask values are different from zero, which results in the output signal.

Suzuki discloses:

- multiplying the input samples by a power of 2 (via adding bits), which results in a modified signal comprising modified samples of m-bit (10-bit) binary numbers (figure 7 and column 5, lines 46-56 of Suzuki). By adding two bits of "0" to the least significant bits, the input signal is multiplied by a factor of 4. For example, the 8-bit binary number 11011011 (219 in decimal) becomes the 10-bit binary number 1101101100 (876 in decimal).
- said filtering step is applied to the modified signal (column 6, lines 11-15 of Suzuki).
- a computing sub-step of mask values (figure 6(S4) of Suzuki) equal to the m-n least significant bits of the filtered samples (column 6, lines 29-38 of Suzuki). The two least significant bits of the 10-bit filtered sample are used to control the output of the converter (column 6, lines 29-38 of Suzuki), thus performing the function of masking for the converter.
- the filtered samples are divided by the power of 2 (figure 9B(center pixel) and column 11, line 66 to column 12, line 7 of Suzuki), which results in the output signal (column 12, lines 8-17 of Suzuki). The input signal is multiplied by 4, as shown above, and then filtered by a low-pass filter. Afterwards, a post filter (figure 15(39) of Suzuki) is applied in order to mitigate image deterioration (column 11, line 66 to column 12, line 4 of Suzuki). The post filter is the same filter as the initial low-pass filter shown in figure 9B of Suzuki (column 12, lines 4-7

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of Suzuki). The input sample under consideration is the center pixel, which is multiplied by a factor of $1/4$ (column 6, line 64 to column 7, line 3 of Suzuki). Thus, the filtered sample is divided by the same power of 2 as the input sample was multiplied by earlier.

Hsieh and Moronaga are combinable with Suzuki because they are from similar problem solving areas, namely the interpolation and filtering of digital input signal data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the input sample bit increase, filtering, and masking set forth in Suzuki to the filtering, edge detection, and random number adding taught by the combination of Hsieh and Moronaga. Since the random number is added to the filtered samples when the mask values are different from zero (since the correction area is defined as where the mask values are non-zero), as taught by the combination of Hsieh and Moronaga in the arguments regarding claim 1 above, then said random number would be added to the filtered samples, as taught by Hsieh and Moronaga, divided by the power of 2, as taught by Suzuki, when the mask values are different from zero, as taught by Hsieh and Moronaga. The motivation for doing so would have been to mitigate image degradation due to quantization (column 3, lines 48-52 of Suzuki). Therefore, it would have been obvious to combine Suzuki with Hsieh and Moronaga to obtain the invention as specified in claim 2.

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8. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh (US Patent 5,594,767), Moronaga (US Patent 5,229,864), and Nakaya (US Patent 6,295,376 B1).

Regarding claim 3: The arguments regarding claim 1 are incorporated herein. Hsieh discloses a computer program product that comprises a set of instructions that, when loaded, carries out the method of claim 1 (figure 2(36) and column 3, lines 58-64 of Hsieh). Since a computer (figure 2(36) of Hsieh) is used to perform the image processing operations (column 3, lines 58-64 of Hsieh), a computer program product comprising a set of computer-executable instructions is inherent.

Hsieh and Moronaga do not disclose expressly that said computer program product is for a television receiver and is loaded into a television receiver.

Nakaya discloses installing an image processing device into a television receiver (column 12, lines 15-17 of Nakaya).

Hsieh and Moronaga are combinable with Nakaya because they are from the same field of endeavor, namely video image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to install the computer program product of Hsieh and Moronaga into a television receiver and use said computer program product for said television receiver, as taught by Nakaya. The motivation for doing so would have been to have the computer programming product in a device that is capable of receiving and displaying digital image data (column 12, lines 27-31 of Nakaya). Therefore, it would have been obvious to combine Nakaya with Hsieh and Moronaga to obtain the invention as specified in claim 3.

Regarding claim 4: The arguments regarding claim 1 are incorporated herein. Hsieh discloses a computer program product that comprises a set of instructions that, when loaded, carries out the method of claim 1 (figure 2(36) and column 3, lines 58-64 of Hsieh). Since a computer (figure 2(36) of Hsieh) is used to perform the image processing operations (column 3, lines 58-64 of Hsieh), a computer program product comprising a set of computer-executable instructions is inherent.

Hsieh and Moronaga does not disclose expressly that said computer program product is for a set-top-box and is loaded into a set-top-box.

Nakaya discloses installing an image processing device into a set top box (column 12, lines 21-23 of Nakaya).

Hsieh and Moronaga are combinable with Nakaya because they are from the same field of endeavor, namely video image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to install the computer program product of Hsieh and Moronaga into a set top box and use said computer program product for said set top box, as taught by Nakaya. The motivation for doing so would have been to have the computer programming product in a device that is capable of receiving and displaying digital image data (column 12, lines 27-31 of Nakaya). Therefore, it would have been obvious to combine Nakaya with Hsieh and Moronaga to obtain the invention as specified in claim 4.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



19 July 2006

James A. Thompson
Examiner
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